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THE SOURCE OF FACILITATION IN THE RECALL OF ASSOCIATES EMBEDDED IN CONNECTED DISCOURSE.

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DESCRIPTORS- *ASSOCIATION (PSYCHOLOGICAL), *PAIRED ASSOCIATE LEARNING, INFORMATION STORAGE, *RECALL (PSYCHOLOGICAL), CONNECTED DISCOURSE,

THE AIM OF THIS STUDY WAS TO COMPARE CONSTRUCTION AND STORAGE EXPLANATIONS OF THE FACILITATING EFFECT UPON RECALL OF ASSOCIATIVE RELATIONSHIPS BETWEEN WORDS EMBEDDED IN CONNECTED DISCOURSE. ONE GROUP OF 36 UNDERGRADUATE SUBJECTS WAS EXPOSED TO A PASSAGE THAT CONTAINED ASSOCIATIVELY RELATED WORD PAIRS, WHILE TWO OTHER GROUPS WERE GIVEN PASSAGES THAT CONTAINED ASSOCIATIVELY UNRELATED WORD PAIRS. THE CONTEXTS OF THE VARIOUS PASSAGES WERE IDENTICAL. THE TASK WAS TO LEARN THE PASSAGE. AFTER A SINGLE STUDY TRIAL, ALL SUBJECTS WERE GIVEN A TEST OF RECOGNITION MEMORY FOR THE CRITICAL WORDS. THE CRITICAL WORDS WERE TAKEN OUT OF CONTEXT AND RANDOMIZED WITHIN A SERIES OF FILLER ITEMS. THUS, THE OPPORTUNITY FOR THE CONSTRUCTION THAT IS LIKELY TO OCCUR DURING RECALL OF CONNECTED DISCOURSE WAS REDUCED. THE GROUP EXPOSED TO THE HIGH ASSOCIATION PASSAGE WAS FOUND TO BE SUPERIOR TO THE OTHER GROUPS ON A MEASURE OF PAIR-RECOGNITION THAT WAS CORRECTED FOR THE TENDENCY TO GIVE FALSE POSITIVES. THESE RESULTS SUGGESTED THAT ASSOCIATIVELY RELATED WORDS OCCURRING IN CONNECTED DISCOURSE ARE STORED MORE EFFICIENTLY THAN ASSOCIATELY UNRELATED WORDS. THIS REPORT APPEARED IN "STUDIES IN LANGUAGE AND LANGUAGE BEHAVIOR, PROGRESS REPORT IV," 1967, CENTER FOR RESEARCH ON LANGUAGE AND LANGUAGE BEHAVIOR, UNIVERSITY OF MICHIGAN, 220 EAST HURON STREET, ANN ARBOR, MICHIGAN 48108. (AUTHOR/JD)

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The Source of Facilitation in the Recall of Associates Embedded in Connected Discourse

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The aim of this study was to compare construction and storage explanations of the facilitating effect upon recall of associative relationships between words embedded in connected discourse. One group of Ss was exposed to a passage that contained associatively-related word pairs, while two other groups were given passages that contained associatively-unrelated word pairs. The contexts of the various passages were identical. The task was to learn the passage. After a single study trial, all Ss were given a test of recognition memory for the critical words. The critical words were taken out of context and randomized within a series of filler items. Thus, the opportunity for the construction that is likely to occur during recall of connected discourse was reduced. The group exposed to the high association passage was found to be superior to the other groups on a measure of pair-recognition that was corrected for the tendency to give false positives. These results suggested that associatively-related words occurring in connected discourse are stored more efficiently than associatively-unrelated words.

From a theoretical standpoint, the most interesting question to be asked about the results of the previous study in this report on the "Recall of noun pairs embedded in connected discourse as a function of association strength" is: Could the facilitation in the recall of high association pairs have been largely a storage phenomenon? Or, if we were to reduce the likelihood of construction during the memory test, would memory for high-association pairs still be superior to memory for low-association pairs? The results of a number of cloze studies (Rosenberg, in preparation) on associative passages in which either the stimulus words (S-words) or the response words (R-words) were deleted, suggest that when someone is asked to guess the words that are deleted, the guessing behavior is influenced by associative habit. Thus, part of S's score on written recall in the case of a passage that contains associatively-related words could be the result of something that went on during retrieval.

There is one fact from the previous study which suggests that the associative facilitation that was observed in the recall of pairs was largely a storage phenomenon. If construction contributed materially to the scores of Ss in the high association (HA) group, Group HA should have recalled significantly more S-words and R-words than the low association (LA) group. That

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is, if both groups recalled approximately the same number of S-words and R-words, then the scores of Ss in Group HA could be enhanced by "good guessing". For example, if S in the HA group had recalled king outright, and guessed queen, he would have been given credit for both words in scoring his recall protocol. A S in Group LA performing in a similar manner would not have been given credit for queen.

To evaluate the storage hypothesis, it is necessary to have a memory test which reduces the likelihood of construction. The task used for that purpose in this study was a variation of one used by Lachman and Tuttle (1965) in a study comparing recall and recognition of passages varying in approximation to English. Basically, the critical S-words and R-words were taken out of the context of the associative passages and randomized within a long list of distracters. The test list, after exposure to a passage, was presented as a paced, successive binary recognition task. While it is probably not possible to eliminate construction entirely from any test of retention, such a task should reduce its likelihood considerably.

Method

Subjects. The Ss for this study were 36 undergraduate volunteers who were paid for participation. These Ss were assigned at random to the same three conditions that were used in the written recall study. There were 12 Ss in each group. Before the N of 36 had been reached, the data from a total of six Ss had to be discarded because the Ss in question failed to complete the recognition test. A group testing procedure was used and the data were collected in two sessions.

Materials. The HA, LA and C passages used in the previous study were used here. This time, however, there were no blank lined sheets attached to the backs of the sheets on which they were printed. The recognition test consisted of a packet of four booklets. Each booklet contained 32 words, one word to a page. There were, in other words, 128 words in the recognition list. The test list contained the 32 critical S-words and R-words for each condition, plus 96 distracters (nouns) which were selected at random from among the A and AA words of the Thorndike and Lorge (1944) norms. Four different random orders of the 128 nouns were constructed, the only limitation on order being that none of the critical words in any of the pairs were permitted to occur contiguously

in the list. The same list was used for each group. Thus, for example, the distracters for Group HA contained the LA R-words and the C S-words.

A metronome was used to pace the recognition test, and a stopwatch was used to time the study trial.

Procedure. The Ss were seated in a classroom as they arrived for the experiment and the materials were given out in rotation (HA-LA-C). The learning and test instructions were delivered at the same time, so that there would be no delay in beginning the recognition test after completion of the study trial. The passages were exposed for 1.5 min. and Ss were instructed to try to learn as much of a passage as they could. For the recognition test, they were instructed to go through their booklets and put a plus down on each page that contained a word that they felt was in the passage and a minus on each page that contained a word that they felt was not in the passage. They were instructed simply that the list contained words that were in the passage and words that were not. In order that the Ss would not spend too much time on each word (a factor that could lead to construction), they were instructed to turn a page every time E called out the word "turn". The turning rate was four sec. The Ss were told that they must put a plus or a minus down on each page.

Results

Table 1 contains the means and SD's for total S-words and R-words (TW)

Insert Table 1 about here

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recognized correctly, and total S-words and R-words recognized correctly (TWP) in which both members of pairs were correct. The TWP measure, in other words, does not contain words that were not recognized correctly, along with the other member of their pair. Since Group HA differed appreciably from Groups LA and C in the tendency to give false positives ($\bar{X}$ = 14.17, 19.08 and 25.75, respectively) the measures of word and pair recall were corrected by the formula $C - 32E/D$, where C is the number of words recognized correctly, E is the number of false positives (incorrect identifications), and D is the number of distracters in the list. S's score would be reduced to zero with this formula, if he identified every word in the test list as having been in the passage. The corrected measures of recognition for TW (TWC) and for TWP (TWPC) have also been summarized in Table 1.

On each of these measures of recognition memory, Group HA was superior to the low-association groups, Groups LA and C. However, on only one of them, TWPC, the corrected measure of pair recall, did the value of F for a simple analysis of variance reach significance ($F(2,33) = 3.69$, $p < .05$). The value of F of 3.24 for TWC approached but did not reach significance at the .05 level. The results of a Tukey Gap Test revealed a significant gap ($p < .05$) between Groups HA and LA but not between Groups LA and C on the TWPC measure.

It should be mentioned here that these results are based upon the data for the two sessions combined. No interactions had been found between sessions and association in the preliminary analysis.

Discussion

The results of this study are similar to the results of the written recall study in that in both instances Group HA was superior to the other groups in memory for words in pairs. Of course, the effect of association upon recognition memory was not a large one, but neither was it large in the case of written recall. One would predict a greater effect in the case where there is more than one associate of a simulus present in an HA passage. Since the recognition-test list did not contain any context words, there was little or no opportunity in the present study for associations between context and critical items to influence performance.

These results suggest that to a certain extent HA word pairs embedded in connected discourse may be stored as pairs (along, of course, with information about the sentences they are in and their positions in the discourse), rather than as individual items. However, perhaps a better test would be to show that the effect is invariant with respect to variations in conditions that might affect the likelihood of construction during a recognition task, such as the number of distracters and the inter-item interval.

References

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Table 1

Means and Standard Deviations for Various Measures of Recognition Memory

Group		Measure			
		TW	TWC	TWP	TWPC
Ha	mean	27.00	22.28	24.50	19.67
	SD	2.70	6.00	4.19	7.43
LA	mean	24.75	18.39	20.50	14.00
	SD	4.09	4.24	5.73	5.74
C	mean	25.83	17.28	22.17	13.58
	SD	3.27	4.79	4.13	4.94